

Amendment Under 37 CFR 1.111
10/644,760

AMENDMENTS TO THE DRAWINGS

Figures 3 and 6.

Attachment: Replacement Sheet(s)

REMARKS

Claims 1-3, all the claims pending in the application, stand rejected. Applicant has amended each of claims 1-3 and has added new claims 4 and 5.

Drawings

The Examiner asserts that Figures 3 and 6 should be designated by the legend "Prior Art". Applicants are amending the drawings in order to comply with the Examiner's requirement.

Claim Objections

Claim 1 is objected to because the claim is not in an appropriate format of preamble, followed by transition phrase, followed by the body. The Examiner suggests that the term "comprising" should be added after "combustion engine." An appropriate change to the claim has been made.

In addition, the Examiner finds the phrase "capable of" to be indefinite. Applicant has amended the claim in order to remedy this basis for objection.

Claim Rejections - 35 U.S.C. § 103

Claims 1 and 2 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Takahashi et al (5,895,839) in view of Bohman et al (4,042,132). This rejection is traversed for at least the following reasons.

As a preliminary matter, Applicants note that the body of the claim is not directed to the ionic current detection apparatus, but instead concerns the arrangement of the coils. Thus, Applicants have now defined the subject matter for the claim to be "an electronic apparatus for an internal combustion engine" which comprises (1) an ionic current detection apparatus and (2) ignition coils.

Given that the invention is truly an electronic apparatus which comprises a combination of both (1) an ionic current detection apparatus and (2) a plurality of ignition coils, Applicants respectfully submit that the claims are patentable over the prior art because there is no teaching in the prior art of such arrangement of ignition coils.

Takahashi et al

The Examiner refers to Takahashi et al for its teaching of a combustion stake detecting apparatus, particularly as illustrated in Fig. 7, where there is a detecting circuit 10 coupled to a plurality of coils (2A-2D), each of which couples to a spark plug (4A-4D). The operation of this device is disclosed at col. 8, lines 3-67. The Examiner admits that Takahashi et al does not disclose the arrangement of the plurality of ignition coils, as claimed. Thus, the claim is clearly patentable over Takahashi.

Bohman

The Examiner looks to Bohman for disclosure of an arrangement of coils where adjacent electrodes do not coincide, i.e., the axes of adjacent coils are perpendicular as allegedly disclosed at col. 1, lines 48-51. However, Bohman is not concerned with the combination of electronic structures, as claimed. Indeed, in the text cited by the Examiner, Bohman merely discusses a prior art patent 3,786,945 that uses a large coil of wire wrapped around a wagon with a signal coil mounted on a discharge spout and situated so that its axis is perpendicular to the axis of the coil of wire wrapped around the wagon. The goal is to prevent minimum coupling between the two coils.

However, this structure has nothing to do with the arrangement of coils that are coupled to spark plugs and to an ionic current detection apparatus. There is no teaching or suggestion that this principle may be applied in any way to the coils of an internal combustion engine. Thus, without the required motivation to rearrange the coils in Takahashi et al on the basis of a farm wagon with automatic spout discharge control, this rejection should be overcome.

Claim 3 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Takahashi in view of Bohman and further in view of Shimizu et al (6,348,797). This rejection is traversed for at least the following reasons.

Shimizu et al

With regard to the rejection, Applicants respectfully submit that the claim is patentable over Takahashi in view of Bohman for reasons already given with regard to claim 1. Further,

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Shimizu et al is merely cited for the use of a fixture for the ignition coils as shown in Figs. 4a and 4b. However, this fixture is not adapted to arrange the coils so that the directions of adjacent ignition coils do not coincide with one another. This feature is nowhere suggested in Shimizu.

New Claims

Finally, Applicants have added new claims directed to the fixture, so that this structure alone may be covered by the patent.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

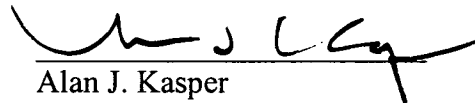
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